all be equally well warmed and lighted,—and, then, that is only in one plane! But there is the whole sphere of space above and below, unoccupied; at any single point of which if an earth were placed at the same distance, it would receive the same amount of light and heat. Take all the planets together, great and small; the light and heat they receive is only one 227 millionth part of the whole quantity thrown out by the sun. All the rest escapes into free space, and is lost among the stars; or does there some other work that we know nothing about. Of the small fraction thus utilized in our system, the earth takes for its share only one 10th part, or less than one 2000 millionth part of the whole supply.

(22.) Now, then, bearing in mind this huge preliminary fact to start with, let us see what amount of *heat* the earth *does* receive from the sun. The earth is a globe; and therefore, taken on an average, it is constantly receiving as much, both of light and heat, as a flat circle 8000 miles in diameter, held perpendicularly to receive it. Now, that section is 50,000,000 square miles, so that there falls at every instant on the whole earth 50,000,000 times as much heat as falls on a square mile of the hottest desert under the equator at noonday with a vertical sun and with not a cloud in the sky—and in fact nearly a third more; for more than a quarter of the sun's heat is absorbed in the air in the clearest weather, and never reaches the ground. Now, we all know that in those countries it is much hotter than we like to keep our rooms by fires. I have seen the thermometer four inches deep in the sand in South Africa rise to 159° Fahrenheit·